Dave R's closeout train of thought download for ongoing work projects

EDC study.

Sampling, exposure and analyses completed. Writing study report for publication in peer reviewed science journal handed off to collaboration of OEA, Battelle and NMFS scientists.

Findings: EPA EDC bioassay non-responsive to exposures of WWTP effluent. However, NMFS detected EDC effects on tissues harvested from test fish using other methodologies. OWW should support finishing and publishing report as it is very relevant to waterwater treatment and EDCs in PS. Contact: Barry Peppich.

Westside FS Temperature TMDL (NWIFC and about 20 individual tribes)

Draft TMDL to be issued by EPA. It is based on NWFP (for protection of spotted owls) → large riparian reserves established for protection of aquatic and terrestrial habitat provides great basis for temperature TMDL. No point sources. More protective than any previous state temperature TMDL (but does not preclude management within RRs). NWFP (and every FS management action since then) undergoes ESA consultation. Our TMDL will implement the ESA recovery plan (NWFP)

Lake Whatcom DO (phosphorus) and Fecal Coliform TMDL (Tribes don't much care)

Lake Whatcom is DW source for over 100K people but development is occurring in the watershed. Algae problems are increasing and DO levels dropping in Lake. Ecology (PSU with EPA funding) developed a CEQALW2 model of the Lake. Then Ecology (CADMUS with EPA funding) developed a HSPF model to determine P delivered in runoff from various land uses plus a translator model (that takes HSPF output into the CEQUAK2K model). Finding: P runoff from various land uses contribute to pollutant loading to Lake. Most of developed portion of Lake watershed is within Phase II municipalities (Whatcom County and City of Bellingham), meaning that conveyed SW discharges are point sources. However,

setting targets for all the outfalls and NPS or monitoring them is infeasible. So, the model was used to identify the amount of *developed area* in the watershed that corresponds with the loading capacity. This TMDL includes targets for BOTH the P loading into the Lake and the amount of developed area in the Lake watershed that corresponds with the P loading target.

TMDL PN action closed. EPA provided comments which need to be addressed to make it approvable.

Soos Creek Aquatic Habitat (stormwater impacts), Dissolved Oxygen and Temperature TMDL (Muckleshoot Tribe)

Innovative SW TMDL with goal to address the effects of MS4 discharges on WQ with **meaningful** targets. Much of the development is in the upper portion of the watershed (different than most stream in PS, also lots of wetlands). SW from developed and developing municipal areas transports pollutants and also changes the hydrologic regime of the Creek. Hydrologic regimes = much higher/frequent peak flows which destabilize stream banks and bed AND lower base flow during critical period because rainfall cannot infiltrate into ground where is gradually flows to stream over a long period of time. The combined effects of SW TMDLs in the NE (Maine and Vermont) term this the urbanizing stream syndrome. In addition, significant GW withdrawls cause lower critical season base flow. These factors were incorporated into the HSPF model of the watershed and used as a tool for predicting pollutant loading and flows associated with stormwater and land uses. Existing and new bioassessment information was compiled to document the condition of aquatic health in the watershed. Ecology does not have biocriteria, but has adopted listing criteria for bioassessment data. This provides a connection between conditions that fully support uses designated in state WQS.

With NEP funding from EPA, King County and UW professor Dr. Horner developed a relationship between certain flow metrics and bioassessment scores (B-IBI) in the WRIA 9 project. The area of WRIA 9 includes the Soos Creek watershed. The EPA contractor utilized these relationships to calculate the amount of effective IC

in sub-basins that would produce flow metrics which correspond with a B-IBI score of 40. This score was selected as providing full support to all designated beneficial uses. Ecology 303(d) listing criteria identifies scores less in PS area as impaired. The EIC values in the draft TMDL seem low and need review.

Squalicum Creek DO and Aquatic Habitat (stormwater impacts) TMDL (Lummi Nation and Nooksack Tribe)

Another innovative SW TMDL with HSPF model of the watershed. Draft TMDL from contractor did not clearly connect the dots between SW and water quality impairment. Bioassessment clearly shows stream is degraded by runoff from development from headwaters to its mouth in Bellingham Bay. Creek still supports 6 runs of salmon.

Deschutes River/Budd Inlet Multi-Parameter TMDL (Squaxin Tribe)

First TMDL attempting to connect impacts of management in watershed to water quality response in Puget Sound receiving water. Started over 10 years ago and costs exceeding an estimate $1.5M. Typical finding for temperature in watershed → need system potential shade throughout watershed. Meeting shade target would also resolve DO problems in River. However, <u>there is absolutely no RA that system potential shade will be restored throughout entire watershed.</u> So, some reduction in nutrient (P) loading to River is needed to resolve DO in freshwater! N traveling downstream contributes to summertime DO problems in Budd Inlet.

Capital Lake was created by an unauthorized structure (no damn license) built to provide a reflecting pool for the state Capital. Ecology modeling with Lake in and Lake out (restored as estuary). Capital Lake causes humongous portion of water quality problem (DO) in Budd Inlet. LOTT WWTP (the only facility providing state-of-the-science treatment for N removal in Puget Sound) but has the misfortune of discharging into waters w/o any loading capacity. Ecology is contemplating

assigning a load reduction to the north boundary of Budd Inlet, meaning dischargers to the north would have to reduce the N in their discharges. EPA could accept with RA (meaning permits and compliance schedules). → State does not have the strength to do this heavy lifting and will try to defer completion of Deschutes/Budd to South Sound DO study.

Loading scenarios for improving DO in Budd Inlet:

Source	Reduced by	effect (mg/l DO)
NPS	26%/50%	0.02/0.04
N removal by 3 small WWTP in Budd		no change
LOTT move outfall north to Boston Harbor		little change
Reduct in N at north Budd boundary	10%/50%	0.04/0.13
LOTT Off during critical period		0.10
Remove Capital Lake dam and restore estuary*		2.0 approx.

* important note: the Capital Lake dam is a "natural conditions" question

South Sound Dissolved Oxygen Study (TMDL?) (Squaxin and potentially numerous other tribes)

Hydraulic and water quality model developed by Ecology to evaluate dissolved oxygen problems in South Puget Sound. Numerous embayments suffer from low DO during the critical season. The study area includes the central PS up to about Edmonds because of concerns that N loading into central PS is contributing to the problems in the South PS. Ecology is now proposing to do a sediment digenesis model which will push completion of the study out another two years and probably more. However, the connection with Budd/Deschutes should make this schedule a concern for EPA! Ecology HQ seems not to be concerned about pace of completing TMDLs.

Little Spokane River DO and pH (Spokane Tribe)

Lead EAP technical staff (Joe Joy) retired end of June, technical work being done out of ERO by inexperienced TMDL staff. Lower LSR receives a lot of groundwater

inflow. However, there is no loading capacity for nutrients and there are point source discharges which dominate loading during the critical period. The most significant point source is a state fish hatchery near mouth of LSR. WLAs for P from the hatchery should equal natural conditions concentration (aka. Leavenworth National Fish hatchery as established in Wenatchee TMDL).

Hangman Creek DO and pH (Spokane Tribe)

Hangman spring time flows can be huge and carry lots of sediment and nutrients from this Ag dominated watershed, whereas late summertime flows are very, very low. The targets assigned for NPS reduction of sediment and nutrients at the mouth of Hangman in the Spokane TMDL are totally unachieveable. Regardless of the targets at the mouth, there is no loading capacity for nutrients in the stream. Ecology-ERO put this TMDL on the back burner (read as 'never get to it') to avoid requiring small municipal WWTPs from having to get out of stream on seasonal basis.

Burn Bridge Creek multiparameter TMDL (Tribe?)

Urbanized stream in Clark County that once supported a robust salmon population, not anymore. SEH America (a computer chip maker) discharges hot noncontact cooling water into headwaters of Creek, causing temperature problems. SEH has played the job card over having to do anything about cooling their effluent. Changes in production practices at SEH seem to have resolved some of the tension and developing this TMDL has become a lower priority at Ecology. Stephanie Brock was diverted to working on Clarks and Soos Creek projects but modeling to support the Burnt Bridge Creek TMDL is nearly complete.

Drayton Harbor FC bacteria (Lummi Nation and Nooksack Tribe)

Technical work completed a couple of years ago, but Ecology staff have not pursued competing TMDL.